

Clerk's File Copy 108

IN THE UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF ILLINOIS  
EASTERN DIVISION

THE MAGNAVOX COMPANY, et al., )  
Plaintiffs, )  
vs. ) No. 74 C 1030  
CHICAGO DYNAMIC INDUSTRIES ) and  
and SEEBURG CORP., ) 74 C 2510  
Defendants. )

Before Honorable JOHN F. GRADY, Judge

November 4, 1976,

1:55 o'clock p.m.

Trial resumed pursuant to recess

PRESENT:

MR. ANDERSON  
MR. WILLIAMS

MR. BRIODY

MR. THREEDY

MR. GOLDENBERG  
MR. RIFKIN

Also present: Mr. Levy

FILED

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H. Stuart Cunningham, Clerk  
United States District Court

THE COURT: Good afternoon, gentlemen.

MR. ANDERSON: Good afternoon, your Honor.

Your Honor, we have now prepared some copies of Exhibit 64-44, and I believe I gave you an original this morning of another copy, which I might recover now and put back into the file from which it came.

THE COURT: Is this the one?

MR. ANDERSON: Yes, your Honor. Thank you.

RALPH H. BAER,

called as a witness herein for and in behalf of the plaintiffs, having been previously duly sworn, resumed the stand and was examined and testified further as follows:

DIRECT EXAMINATION (resumed)

BY MR. ANDERSON:

Q Mr. Baer, immediately prior to our luncheon break you began to testify with respect to Exhibit 64-44. Do you have that exhibit in front of you now?

A Yes, I do.

Q I think you said that this was typed by your secretary, is that correct?

A That is correct.

Q From draft material that Mr. Rush prepared?

A Yes.

Q I think you had just started to describe what

is contained in this memo. Would you proceed to do that, please?

A I will start out by summarizing what is in here, by reading the heading. There are some 20-odd potential game areas described in here, starting out with picture drawing, under heading 1, car steering, chase games, maze games, rotating spiral games, racing games, roulette games, baseball guessing game, baseball skill game, a map game, trace of bullet-shooting game, another baseball skill game, another skeetshooting game, ESP game, hares and hound game, bullfight game, under 18 soccer, hockey, polo, et cetera, ball games, 19, skeet, airplane shooting, golf putting, horse racing, and some general comments on the back page of this memo.

Q Were any of these games that are set forth in this memo pursued or actually built in your group after May 10, 1967?

A Yes, quite a number of them.

Q Can you state which ones were actually pursued and built?

A Going down the list, from top to bottom, chase games, which were basically games in which one spot was caused to chase another one, and the player participation, which is item 4 on this list, appeared in the early games. Maze games were similarly played with overlays used on the

picture tube to create mazes.

Racing games we had early in the effort. Such things as certainly item 18, in particular soccer, hockey, polo, which was the mainstay of the activity, starting about the middle of '67.

All those games which are referred to here as being shooting games, skeet, airplane, et cetera, types of shooting games, they came into being early in '67 and many variations of those were built or played during the course of '67, '68.

Does that answer your question?

Q With respect to the entry 18 on page 64-49, soccer, hockey, polo, et cetera, Mr. Baer, can you state what was contemplated in those games in the way of player activity?

A Yes, let me read it for a second. It is pretty clear.

It says:

"Each player has X men, positioned by a joy stick. Also allow less men. If only two, let's use two men, controlling a joy stick in each hand."

So what was contemplated was a minimum team-type effort of two players on screen handling a ball, kicking a ball, pushing a ball, or whatever the

proper terminology is that is a function of the game that was simulated.

In a hockey game you would say hitting. In a soccer game, I would say you would say kicking it. In a handball game, I would guess you would say throwing it, but essentially, as far as the action on the screen that was visualized was concerned, it was a matter of putting symbology on the screen that represented the players, which were movable under the human participant control, and a puck or ball or whatever, which could be used in a simulated game.

It also says here in the second paragraph:

"When the ball or puck, et cetera, is

touched by a man --"

by a man, he means the symbol on the screen --

"it moves in the direction the man was going."

Then he adds the note --

"May be notified so that the ball moves away from a man, like a kicked ball or a passed puck, and/or allow the man to nudge the ball along, like a hockey player moving a puck with him, dribbling."

Q Were any of the ideas set forth in paragraph 18 on page 64-49 pursued by your group?

A Yes, they were.

Q Did any of the other games suggested in Mr. Rush's memo, Exhibit 64-44 through 64-50, discuss games in which there were players, controlled by the participants, which touched another symbol such as a ball, and caused it to move away?

A Yes, there must be several. I am looking at page 49, which under the heading 20 talks about golf putting.

In golf putting there was interaction between a simulated putter and a ball, and eventually also a ball in a simulated hole on the screen.

Q In the course of your group's activity following the memo of Mr. Rush, Exhibit 64-44 through -50, what happened next, if you recall?

A We began to build -- by we, I mean Harrison and Rush and I, particularly Harrison, who did the physical work -- began to build the next iteration in our series of hardware, starting about May 1st or May 2nd of '67, which incorporated some of the features of this paper, this memo, and to the best of my recollection was finished within a matter of three or four weeks.

Q And do you recall what that game was or how it was played at that time?

A Yes. I believe that was a basic two spot or two symbol game in which both players have the ability to move two symbols or spots around on the screen so as to produce chase games or maze games, and, if I'm not mistaken, it might have included by this time the recognition of what we came to call co-incidence. That is, the coexistence of two symbols on the screen in the same place, or two symbols touching each other or overlapping each other on the screen.

Q I hand you Plaintiffs' Exhibit 66-33 and ask you if you can relate that exhibit to your testimony?

A At the top of the page Bill Harrison, whose notebook this is excerpted from --

Q I'm sorry. I should have asked you that first. What is the document I have placed before you, Exhibit 66-33?

A It is a page out of Bill Harrison's notebook, dated 5-18-67.

Q When did you first see this page with the material entered on it?

A On the same day, and I signed it on the same day, to that effect.

Q Would you describe what is shown on that page

and how it relates to the work that was going on in your group?

A At the top of the page Bill Harrison makes the following entry:

"Circuitry and control on previous page were assembled, and via paper overlay on TV screen the first contest was played between R. S. Baer and W. Harrison."

He mentions that the winner's name shall be withheld, so he must have won, I guess.

What he was referring to was a game in which we both had the ability to move independent symbols on the screen over the screen. One of us took the place of someone chasing the other, and if that spot which was chasing the second spot caught up with the first spot, there was a change in the display. In this case I believe there was a change in the color of the background.

So we detected coincidence between the two spots on the screen, and when the coincidence was detected between the two spots on the screen, when there was a contact or overlapping, there was a resultant effect on the screen. I think it was a change in color.

MR. GOLDENBERG: Your Honor, I have a problem with the witness' answer in this respect. This

is Mr. Harrison's notebook, if I understand it, and the witness is giving testimony that Mr. Harrison wrote it, and we don't really know that. There is substantial hearsay in the witness' testimony.

I don't know that it is important at this point, but I think the witness should be cautioned when he answers the question to speak from that which is his own knowledge. I don't know whether Mr. Harrison wrote this or not. The witness may know that. But he certain has not said so.

THE COURT: Perhaps on these documents, Mr. Anderson, you could establish the familiarity of the witness with the particular matter in the documents.

MR. ANDERSON: I will of course, your Honor.

The witness did testify that he signed it and dated it on the day that it was prepared. I will establish that additional foundation and I might say that Mr. Harrison's and Mr. Rush's depositions were taken for I think a total of thirteen or fourteen days, going through these pages meticulously, and that will be in evidence to establish what was done and who did it.

BY MR. ANDERSON:

Q Mr. Baer, were you the R. H. Baer that played the game that is noted in the first paragraph of Exhibit 56-33?

A Yes, sir.

Q Were you present at the time that that game between you and Mr. Harrison --

THE COURT: I think he means this document. That is what he is talking about.

MR. GOLDENBERG: Yes, your Honor.

I understand that the witness has testified this is his signature on the document, and of course I believe that to be proper testimony. But as to anything beyond that, I don't think that he can testify about it. I think he certainly can testify if there was any event he attended and can describe that and whether Mr. Harrison was there, and that kind of

THE COURT: Is Mr. Harrison going to testify?

MR. ANDERSON: We had not intended to call Mr. Harrison because of the extensive deposition testimony.

MR. GOLDENBERG: The problem, your Honor -- and this has significance in this respect -- is I think Mr. Anderson would agree with me that --

THE COURT: Mr. Baer was the inventor and therefore what is in his mind is the important thing. Is that what you are saying?

MR. GOLDENBERG: That is part of it, your Honor.

Then in patent matters, as to when an invention was made and what was done, the law is quite clear that whoever is the inventor, that testimony must be corroborated, either by the testimony of other people or by admissible documentary evidence.

Mr. Baer is a patentee, and one of the patents -- and I am not sure what is happening here with the putting in of these documents because I think the law is, as I say it is, that it should be done in the proper way with respect to identification and such matters as that.

THE COURT: Does this deposition testimony of Mr. Harrison furnish the corroboration, *prima facie*, that you are talking about?

MR. GOLDENBERG: I believe it does, your Honor, and this is the first I have heard that Mr. Harrison's deposition is going into evidence.

THE COURT: I realize that there might be a problem along the lines you mention, but I also am interested in the shortest line between two points here.

If this is not really critical at this point, I would rather be more informal about it.

MR. GOLDENBERG: It is not our desire to delay, but there is a certain level of proof required in these matters, and I am not too sure that this is important at this point, and I really think that what Mr. Baer is telling us about now is what he did.

THE COURT: Perhaps these documents could be used at this point to refresh the recollection of this witness rather than to have him testify as to their contents, if he didn't make them.

Now, I suppose in another sense these are documents made in the ordinary course of business and could be offered on that basis.

MR. GOLDENBERG: Well, there is a split on that, your Honor, that engineering and laboratory notebooks are not necessarily documents made in the normal

course of business.

I can't tell you that I have researched the point recently, but I do have it in mind that that is by no means a certainty.

MR. ANDERSON: Your Honor, I am not certain now exactly what the objection is. It has not been phrased quite as an objection, I do not think.

THE COURT: I think the objection is that the defendants don't want this witness to testify to anything that Mr. Harrison said, which is offered for the truth of the statements. Basically it is a hearsay objection.

MR. ANDERSON: I have no problem really understanding that. I think we can avoid that. This witness can testify of his own knowledge about this event, where he clearly was present.

THE COURT: Why don't you just use these documents prepared by other people by way of refreshing this witness' recollection and let him testify of his own knowledge as to what he said or what he did, what he knew about it.

MR. ANDERSON: Yes, your Honor.

I might say we have identified these some time ago, and we had indicated that Mr. Baer would be the only live witness, and there was no indication of any objection to the document as documents. I take it that is not your objection at this time, with respect to the documents.

MR. GOLDENBERG: No, because I understand now that Mr. Harrison's deposition is going to come into the record, and I think the question of the authenticity, the genuineness of this document, whatever Mr. Harrison had to say about it, this Court will have the benefit of it.

THE COURT: All right.

BY MR. ANDERSON:

Q Mr. Baer, I would like you to refer to the diagram, the circuit diagram, which appears at the bottom of Exhibit 64-33 and I ask you whether you are personally familiar with the circuit that is depicted in that circuit diagram?

A Yes, I am.

Q Do you know of your own knowledge whether or not that circuit was actually put together in your group?

A Yes, it was.

Q Approximately when, from your own knowledge, was that circuit put together?

A Well, several times. The first time in a period of May and June of 1967.

Q Can you describe how the circuit that was put together in May and June of 1967 functioned in playing any games on the TV screen?

A If you will give me a minute to look at this --

What this represents is a game which the two participants each have a push button switch which they are required to push as rapidly as they can in the progress of the game.

As they push the switch, the circuitry manages to build up a voltage, which either goes up or down, depending on which of the two participants manages

to push the switch more rapidly.

So you could say in a sense that one participant is winning over the other one if his voltage is going in his direction. That voltage is used to enter a spot generator which is identified on this page that we are looking at at the bottom as "Vert DMV" or delayed multivibrator.

So what we are doing is using a contest in which the pumping action of one man versus another moved the spot up and down on the screen. If not a spot, at least a horizon bar, a line going across the screen, the object evidently being to push the spot either fully upward for one participant or all the way down to the bottom of the screen for the other participant, to result in a win.

Q Are the two pushbuttons that were on the equipment that you made the game on, shown in the circuit diagram on Exhibit 64-33?

A Yes, they are.

Q Where are they, please?

A The upper left and upper right of the small schematic in the bottom right-hand corner. If you look at the three circles, one of which has an arrow emanating from it, you will find a group on the left and a group on the right. That is a standard symbol for a switch.

Q I notice the letters on the left side at least, "NO", just above the middle circle, and -- well, that is just below the middle circle. Also there is "NC" just above the middle circle.

What does that denote?

A "NO" stands for "normally open". That indicates that the switch which has two positions is normally open across the contact shown. That means there is no connection there.

Up above you will see the letters "NC" for "normally closed". That means that the switch in its normal, non-depressed position is normally connecting or closes those two contacts.

Q That switch constitutes the player's manipulated piece?

A That's right.

Q Where is the output of this circuit taken for giving an output from the game?

A If you follow the resistor which connects near the top of the diagram to the "plus 9 volts" down vertically, the "plus 9 V", you come to a point where many parts join. That is the output.

Q Is that quite central on this diagram?

A Right in the middle, right.

Q Does the output go from there to somewhere else, as shown on this diagram?

A Yes, it goes down.

Q Straight down?

A Into the vertical delay multivibrator circle.

Q How is that indicated on the drawing?

A Through the connection, through a potentiometer or resistor, a variable control.

Q Is that labeled "VERT DMV"?

A The entire circuit down below is labeled "Vert. DMV" or Vertical delay multivibrator.

Q From your knowledge of that circuit at that time, was that vertical delay multivibrator used in the game?

A Yes, I believe, as I indicated, it was used to move a horizon bar or a spot -- I don't remember quite which at that early point -- vertically up and down to show graphically to the participants who was winning and who was losing.

Q In the work that your group did on television games, TVG, what happened next, as you recall?

A We moved on to another design. There was a whole series of designs that followed each other in very rapid succession through the next few weeks. In fact, most of the efforts were measured in weeks and days, not months.

One of the objectives at the time was to take a look at what we had created from the point of view of cost because the objective was to get to a commercial machine.

There may be a bill of materials or parts list in existence that shows how far we had gotten in that regard.

We moved right on into another development which incorporated, if I recollect properly, a whole series of small bread boards that had been built over

several days and weeks in one chassis, which was then demonstrated as a composite to several members of Sanders' management sometime early in June, I think.

Q I hand you Plaintiffs' Exhibit 66-42 and ask you if you can state what that document is?

A The block diagram near the bottom third of the page is descriptive of a game in which there are two individual spot generators for the purpose of manipulating two spots on the screen through external controls by two participant players.

Q Can you describe that?

First of all, who prepared the sheet, Exhibit 66-42?

A Again, it is a page out of Bill Harrison's notebook, which he kept on a daily basis.

Q When did you first see that page as it was completed there?

A On the same date as the day when the work was done, May 23, '67.

Q You signed and dated it at that time, did you?

A Yes, I did.

Q Were you aware of the work that was going on in your group, including the work of Mr. Harrison, on that day?

A Certainly, and may I back up a bit here and

explain the circumstances under which this work was done.

We had a laboratory set up on the 6th floor of the Canal Street building of Sanders Associates, to which only the three of us had a key. Harrison and Rush physically lived in there full time. I walked in and out of there many times during the day, as many times as I could get away from my desk and often after hours to participate on a daily basis.

So there is no question as to my knowing what was going on on a day by day real time basis. Furthermore, the division, in fact company requirements, for keeping daily records of our bench activities is clearly adhered to, and that is how these pieces of paper came to be generated.

Q Do you know if the circuit shown in the block diagram at the bottom of Exhibit 66-42 was actually built at about May 23, 1967?

A Yes, sir.

Q You mentioned that that relates to a two spot game. Can you describe in a little more detail on a block by block basis just where the inputs come from and how they are put together to form an output that can be used for that purpose?

A Certainly. If you will look at the top two

blocks on this block diagram, you will find them labeled "Horizontal DMV (variable)" and the one next to it is marked "Pulse Shaper".

The purpose of the first block is to create an electronic signal which produces delays, time delays, with respect to horizontal sync. You will notice that horizontal synchronization signals are caused to go into the left-hand side of that block. It is somewhat hard to read, but it says "Horizontal sync in" next to the waveform picture to the left of the horizontal delay multivibrator block.

There is a further timing diagram between the first and second block, with a double arrow on it, which indicates that it was a function of that first block to move a waveform backwards and forwards in time in response to a control.

The pulse shaper then took this delayed waveform and made it into a narrow pulse, and by narrow, I mean a pulse which was wide enough to create a spot of a desired width on the screen of the TV set.

Q Is this circuitry which you actually observed as of May 23, 1967, when you signed this notebook page?

A Yes, no question about it.

Q All right, then go on and describe in fairly brief and functional detail what the output of the pulse shaper did.

A The output of the pulse shaper was AND-gated with -- and that is a technical term, which I think you can simply translate as just summed with, mixed with, summed with -- a similar output pulse from the two blocks below, which did the same thing as the above blocks but did it on a picture-by-picture vertical basis.

If you look into the box below, you see a repeat of everything we have looked at before above, except that this time we are looking at those parts which are controlled by the alternate human participant.

THE COURT: I don't understand, Mr. Baer. You said except it did it on a picture-by-picture vertical basis.

As distinguished from what?

THE WITNESS: As distinguished from a line-by-line horizontal basis.

A picture is structured out of many lines, as you learned this morning, and then those pictures are repeated, either identically, or if there is

motion, somewhat differently.

Each vertical interval time, that is, after you come from the bottom, you come back up to the top and now we are talking about essentially a new picture, a new frame. These are all the same terms.

In order to create the picture you will recall you have to brighten up or lighten up a series of lines.

Stop thinking about that figure you saw this morning and think about a simple rectangle. It is pretty clear that all you need to do is lighten up certain segments along this long line, and you will have a rectangle created out there. If you light up 10 lines, a rectangle will be created 10 lines high.

Ten lines high happens to be a time interval of 10 horizontal lines. As I said earlier this morning, each horizontal line lasts for about 60 microseconds, so 10 lines is roughly 650 microseconds.

If you allowed horizontal lines to be written for that period of time, 8 lines would show up or 10 lines would show up once in this picture, and to make sure that they only show up once in this picture you have to create circuitry that says, "You will start writing your lines now," and over here it says, "Quit writing your lines."

That is the vertical component of the picture, which is accomplished by this vertical delay multivibrator and pulse-shaper, the second series of blocks down.

You always have these two components, the horizontal component and the vertical component, in any TV picture.

THE COURT: I see. I focused on the wrong part of what you said. I understood in the first place and thought I didn't.

All right.

BY MR. ANDERSON:

Q Mr. Baer, when you have stated that the horizontal delay multivibrator was variable, that means that this lighted spot can be moved to the right and left by varying that horizontal DMV, is that correct?

MR. GOLDENBERG: Excuse me --

THE WITNESS: That is the purpose --

MR. GOLDENBERG: Your Honor, that was a leading question.

MR. ANDERSON: Yes, it was.

MR. GOLDENBERG: I recognize the need to sometimes ask those to move the matter along. I will not object to this one, but I am going to reserve my right with respect to future questions.

THE COURT: Here again, in the interest of saving time, when you are dealing with an expert witness, very often leading questions would be harmless.

If you see them getting into an area where you think they are not harmless, don't hesitate to object. I would assume Mr. Anderson and you probably would have a meeting of the mind on where that point is anyway. So I will just ask Mr. Anderson not to do it, where he senses there may be an objection.

MR. ANDERSON: I thought this was so unequivocal a matter of tutorial explanation that I did knowingly lead the witness.

MR. GOLDENBERG: I just wanted to get the ground rules established, your Honor, that is all.

THE COURT: I recall reading a book that is out of print now. It is called "Opinion Evidence in Illinois." I forget the author, but it was put out in the late twenties or early thirties.

The author pointed out at one point that it really makes a difference what the issue is as to whether a leading question is harmful or whether something is a conclusion or not. He gave an example. I think he used the example of a chair and said if it is an ordinary case and the witness said he sat in a chair, there would be no objection. If it is a patent

case, the question is whether or not this is a chair, and now all of a sudden he is stating a conclusion or he is being led or something like that.

So here certainly on those areas where there is no dispute, there is nothing wrong with leading the witness. Sometimes the leading question of counsel can be phrased in more layman-like terms than the answer the witness might make, and, thereby, make it more understandable to the judge.

MR. GOLDENBERG: I agree, your Honor.

THE COURT: All right.

MR. GOLDENBERG: Thank you.

MR. ANDERSON: Thank you.

BY MR. ANDERSON:

Q Mr. Baer, I was trying to make as clear as possible that if the circuit that you had on May 23, 1967, as you have said, put two spots on the screen, I would just like you to say with respect to the four horizontal layers of this circuit diagram, what each horizontal layer did with respect to those two spots in general terms?

A I am sorry. I thought I did. I will try it again.

Q I think you did, but I want --

THE COURT: Are the bottom two the same as the top two?

THE WITNESS: Yes, sir.

THE COURT: They are just for a different player?

THE WITNESS: They are the other player's components.

THE COURT: I think I probably understand it as well as I ever will.

BY MR. ANDERSON:

Q Then, Mr. Baer, will you explain, as you have already explained, that the top AND-gate combines the horizontal and vertical information for the first spot.

A That is right.

Q Then I take it the bottom AND-gate combines the horizontal and vertical information for the second

spot, is that correct?

A That is correct.

Q Then will you explain what happens after that in the circuits shown and what did happen in the demonstration unit that you built up in May of 1967 with respect to that information?

A There is one symbol left that we haven't touched on on the right-hand side of the piece of paper, the triangular symbol designated as "Summer Amp," Amp. standing for amplifier.

You can see that the outputs from the two spot generators, through two resistors, the squiggly lines, joined and entered the summer on the left of this triangular symbol. The purpose of that summer then is simply to amplify the resultant signal somewhat before applying them to a transmitter. It is the equivalent of a small transmitter.

Q In the 1967 construction then, what additional equipment, if any, was in your set up after the summer amplifier?

A A small transmitter, which we constructed at the time.

Q Then what was done with that?

A That was applied to the terminals of the RCA color TV set we had in the lab, to which I referred

earlier, so as to display the symbology we had generated for spots on the screen of the TV set.

Q What additional work after the work indicated in the lab notebook, page 66-42, did your group do on TV games after that?

A I think we are still talking about the piece of equipment which the two-spot generator we just discussed here was built into.

There were additional bread boards in that equipment, and I seem to recall that the pumping game was also part of that equipment and perhaps one or two other things. I am quite sure that a rifle attachment was also part of that early game.

Q In that early game in May of 1967, what was done with the two spots? Were they used to play any kind of a game?

A Yes, they were used to play chase games primarily, and also games imitative of board games, in which you would move the spots about the screen, as you would checkers on a checkerboard.

Q In those games, in particular the chase game, what was the effect in this equipment that you built in '67, in May, if the chaser caught the chasee?

A I believe that the coincidence of two spots on the screen was sensed to cause some effect, and I

don't quite recall whether that effect was a change of color background or whether it resulted in wiping out one of the spots.

I would have to see other documents to refresh my memory.

Q I hand you Plaintiffs' Exhibit 66-45, and I ask you if you can identify that document?

A Yes, sir, I can.

Q What is that document, Mr. Baer?

A It is another page out of Harrison's notebook, dated the 24th of May, '67.

THE COURT: I think we have a good enough foundation between him and this notebook now. You don't have to go through foundation for each document.

MR. ANDERSON: Fine, thank you.

BY MR. ANDERSON:

Q Mr. Baer, can you describe and relate to the work that was done in May of '67 the information that is on page-45 of this notebook?

A Yes, when you look at the bottom of the page you will see a schematic, which is identified to the left of it as a "Coincidence Ckt," Ckt being an abbreviation for "circuit".

That circuit provides the function I just referred to, that is, the identification of a coexistence in space, if you will, on a picture tube of two symbols, the touching, overlapping of two symbols.

Q Reading the material on page -45 and the material relating to that coincidence circuit, does that refresh your recollection as to what the effect was in the unit that you built in May of '67?

A Yes, it does.

Q Will you describe that, please?

A When you look at the schematic again at the bottom of the page, you will see an arrow going off to the right, the output of the circuit, and next to it are the words "To SCR," which stands for silicon control rectifier, "To SCR gate in timing circuit," and some other words.

That refreshes my memory. What that did was trigger a device, which is called a SCR, which in turn

caused -- no, it doesn't -- caused a change of display, but I still don't know whether the change was a color change or change of scene.

Q Would you read the legend immediately above the coincidence circuit about which you have been testifying, and state whether or not that refreshes your recollection?

A O.K., that takes care of that.

What we actually did was change the color of one of the player's symbols -- they were colored, not just black and white -- to a different color, when coincidence was established.

Q Is there a relationship between this coincidence circuit of Exhibit 66-45 and the two-dot circuit about which you testified and as shown in Exhibit 66-42?

A Yes, sir, the coincidence circuit on 66-45 requires two inputs, which are described here as character number 1 and character number 2.

By that is meant that the outputs from the two symbols, spot generators, on 66-42 are required to be connected to those two points, that is, the two symbols that are on the screen input those two points of a coincidence circuit.

Q In the equipment that you built in May of '67, as described in these diagrams, then will you just functionally

describe what player controls were available externally and how they were used to play the game and what happened to score in some way, if there was such a scoring?

A In the case of those games that revolved around the two circuits shown on the two pages we are looking at, there were both a vertical and a horizontal positioning control available to each of the participants in the game, and the object, if a chase game were being played, again being for one guy to chase the other.

Once coincidence electronically was established, that is, once the circuitry sensed that one individual had caught up with the other, one spot had caught up with the other man's spot, the resultant action was caused to happen. We just found out what did happen here was to turn one of the participant's symbols on the screen a different color so he knew that he had been caught up with.

How they scored was purely arbitrary. It was scored with a pencil and paper.

Q What, if anything, was done with that circuit, including the chase circuit you have just described, after about May 24, 1967?

A That circuit is sort of generic in that it allows the sensing of coincidence for any two symbols on the screen. That was used many times afterwards in

different technical forms to denote the coincidence, say, between a ball and a player symbol, or a hit and a hitting spot, if you will, and for many other occasions. So it is sort of a generic circuit. This is its first appearance.

Q Did you demonstrate that circuit for anyone?

A Yes, it was part of a large demonstration box, which we built right about that period and demonstrated early in June, May-June, I think it was, of '67.

Q For whom did you make such a demonstration?

A I believe the first demonstration was to Mr. Campman, who was our corporate director of independent research and development, and with him at the time was Mr. Etlinger, who is our corporate director of patents.

I believe on a subsequent day we had another demonstration.

Q I hand you Plaintiffs' Exhibit 66-63 and ask you if that relates to the demonstration that you have just testified about?

You might read the entire entry into the record. It is so short.

A Yes, that is an entry in Harrison's notebook by Mr. Etlinger, in his handwriting, which says the following:

"On June 14, 1967 observed and participated in complete set of games described in summary of major games dated 6-6-67 by R. Baer,"

and underneath appears Louis Etlinger's signature and the date June 14, '67, and right below that H. W. Campman,

Jr., 6-14-67, signed the same piece of paper.

Q Who was Louis Etlinger, Mr. Baer?

A Our corporate director of patents.

Q Of Sanders Associates?

A Sanders Associates.

Q Who was Mr. Campman?

A The corporate director of IR&D, independent research and development of Sanders.

Q I hand you Plaintiffs' Exhibit 66-63-A and this is a memorandum bearing the date 6-6-67 and your signature.

Can you relate that memo to the prior page and to your testimony in regard to games?

A Yes, this is the summary of major games which Mr. Etlinger referred to in the note we just looked at.

MR. ANDERSON: Your Honor, we have had a typed copy of this one prepared.

I will hand the witness Plaintiffs' Exhibit 64-63-A-1, the -1 indicating that it is a typed version.

BY MR. ANDERSON:

Q Mr. Baer, have you compared the typed version, 64-63-A-1, with the original longhand memo, Exhibit 64-63-A?

A Yes, I have.

THE COURT: The original is in your handwriting, is that right?

THE WITNESS: That is right, sir.

BY MR. ANDERSON:

Q Will you then state what you have recorded of the work that was done by your group on TV games in Exhibit 64-63-A?

A Yes, sir. We demonstrated seven different games, and they are listed sequentially, 1 through 7.

We demonstrated the use of two spots in a simulated chess board game. Then we demonstrated what we call the fox hunt game, which was essentially the kind of chase game I described here a few minutes ago, in which one spot was used to chase another spot over the screen, and for the purpose of making a nice game out of it, we created a whole series of ground rules and game rules, which in effect --

THE COURT: What is an orothogonal move?

THE WITNESS: It is at right angles, not diagonal. Ortho is straight.

That is item 2. In item 3 we describe a fox and hound chase in which we use a different technology we haven't talked about before, which was built into that chassis to create more than two player spots on the screen.

In fact, the script here says that there are three white hounds up on the screen and one fox.

Do I need to go into how that is done technically, Mr. Anderson?

BY MR. ANDERSON:

Q No, I think not.

You did say that the number 2 game in Exhibit 64-63A, the fox hunt, is the chase game that you had previously testified about?

A Yes, sir.

Q How does that description of the fox hunt relate to the circuit diagrams about which you testified in Exhibits 66-42 and 66-45?

A It appears that when one spot caught up with another, as it says here, "A hit was made", all action ceases because the screen turned red.

Q From your longhand memorandum, 64-63A, can you state when the two demonstrations about which you previously testified occurred?

A Yes, I can. If you will look at the second page, 66-63B, I wrote a statement near the bottom of the page in my handwriting, which says that "the above games," meaning all the games in the summary of major games, "were demonstrated to L. Etlinger and H. Campman on 6-14-67, 8:00 to 9:30 p.m.. See page 63," meaning the book from which the Etlinger note was extracted, "and on 6-15-67 to R.C. Sanders, Jr., H. Pope and D. Chisholm."

Q Mr. Baer, you have used the term microseconds in several answers a while back, and I meant to ask you

what a microsecond was.

You also used the term millisecond at one point.

A Microsecond is a millionth of a second. A millisecond is a thousandth of a second. A thousand microseconds make one millisecond.

Q Mr. Baer, after the demonstrations of June 14 and June 15, 1967, what happened next in your group's development of TV games, if you recall?

A I believe we immediately started on the design of a new unit, with the objective of reducing component count, and having gained more familiarity with the kinds of games that played well and those that turned out to be too trivial to consider for a real product, we concentrated on a limited group of games and built a piece of equipment that would respond to that need.

I think that equipment must have been finished in a matter of three or four weeks after the demonstration.

Q Does the chassis that was actually used for the Etlinger and Campman demonstration on the 14th of June, 1967, and the Sanders, Pope and Chisholm demonstration on the 15th of June, '67, still exist?

A Yes, it does, and I believe it is in the courtroom.

Q I place before you Plaintiffs' Exhibit 56.  
Is that the piece of equipment?

A Yes, it is.

Q Can you just functionally point it out, without going into what is on the underside, how the controls on the top were used to play games in June of 1967?

MR. GOLDENBERG: Your Honor, might I stand by the witness?

THE COURT: Sure, Mr. Goldenberg.

Mr. Threedy, do you want to come up, too?

BY THE WITNESS:

A I am afraid to scratch the top by laying this thing down.

MR. ANDERSON: This is Sanders Associates Deposition Exhibit 28, if that helps you identify it, Mr. Goldenberg.

MR. GOLDENBERG: Thank you.

BY THE WITNESS:

A If you look at the switch at the bottom, which is marked "Function selector", the switch indicates that you are able to switch to at least three different functionally different games, one labeled Dots and Bars, one labeled Split Field, and one labeled Monochrome.

There is also a control here that had to do with a color change marked Phase shift.

The two-button switch, which relates to the pumping game we discussed a little earlier, are in the corners here, with one participant evidently being able to move the spot down by pushing the left-hand knob, looking from the front of the chassis, and the other participant being able to move the spot up on the screen through the use of this right-hand knob.

There is a timer in here, which we have not discussed. There was a built-in timing function. You could play against time, and as you ran against time in playing your games the screen would flash a different color, which is sort of trivial.

Here is another adjustment which allows you to go from dots displayed on the screen to bars, some reset knobs, and at the end of the cable where there are the hand controls for vertical and horizontal position, I guess they are lost to antiquity.

Q This is the equipment that you actually recall demonstrating on the 14th and 15th of June, 1967?

A That is what happens when you put a bread board together.

Q That is the piece of equipment?

A That is the piece of equipment, yes, sir.

Q Do you recall how the presentation was actually presented to the participants, Mr. Sanders and Pope, on

June 15th 1967?

A Yes, I do, because we took special pains to make sure that we put on a good demonstration for the president of the company.

Q How was it done?

A I decided to tape an oral presentation on a small cassette tape so we wouldn't blunder through the explanation of these complicated game rules we have invented.

We actually hurried and built and small FM transmitter, which allowed us to bring this audio type cassette sound right out through the loudspeaker on the TV set on which we played games.

Before each new game was introduced, we flicked on the cassette tape, and out came my verbal presentation, minus stuttering, of just what we were going to demonstrate next.

Q I hand you Plaintiffs' Exhibit 74A. Is that the tape that you used for that June, 1967 demonstration?

A Yes, it is.

Q I hand you Plaintiffs' Exhibit 74B and ask you if that is in your handwriting?

A Yes, sir.

Q What is it, please?

A It is a handwritten transcript of what is on this cassette tape.

Q Does it describe or have a section on the chase game that you just testified about a few minutes ago?

A Yes. If you will look at the left-hand side, the same headings are there:

1. Chess.
2. Steeple Chase.
3. Fox and Hounds Chase.
4. Target Shooting.
5. Color (Pot) Wheel

Q Is number 2 --

A Number 6 --

Q Excuse me.

A Number 6 doesn't have a heading.

Number 7 doesn't have a heading. Well, yes. 7 is the pumping game.

Q Does number 2 on this list or description of the games that was on the tape cassette correspond to number 2 in your list of games, namely, the Fox Hunt?

A Yes, sir, it does.

Q Can you explain why it is called "Steeple Chase" in the exhibit?

A I guess we took some liberties. But it is

the same thing. It is all through here. There should be one for one correspondence.

I guess I don't know what a steeple chase is.

Q Mr. Baer, what happened then as the next step in your game development program at Sanders after the demonstration?

A I believe I already indicated we moved right on into the next piece of equipment, which eliminated some of the more trivial games that we weren't particularly happy with, and also reduced the component content and physical size of the thing, so it was more manageable. All that must have happened within the next three, four, five weeks.

Q I will hand you Plaintiffs' Exhibit 66-82A, which is a circuit diagram that was produced from Sanders' files, and ask you if you can state what that is and when you first saw it?

A Yes, sir. That is what we like to term a cleaned-up schematic, drawn at the end of a development job, which describes a piece of equipment at the time it was finished, the date here being 8-2-67.

Looking at the schematic, it recalls to mind that we thought we might make this piece of equipment in modular fashion, that is, to build those parts of the system that are self-contained, such as a spot generator, for example, in terms of its circuit function on a separate little plug-in card.

If you look at those dash lines on that

schematic, there are a number of them and they are closed boxes encircling, if you will, areas of circuitry that are self-contained in function. For example, it says, "Plug-in card" near the top right-hand side of the page. Below that, below those words, there is a series of dash lines that encloses one of the spot generators.

If you look at the lower left-hand side of the schematic, you find another enclosed area also labeled "Plug-in card", which contains the second of the spot generators.

If you had the time you could compare them and you would find them to be identical, one-for-one.

So this equipment contained at least two plug-in cards, and in addition to these two plug-in card spot generators it also included the horizontal and vertical synchronization generators which are here labeled "Horizontal oscillator" and "Vertical oscillator".

Q Those are in the upper left-hand corner of the drawing, Exhibit 66-82, is that correct?

A Right. It also included the AND-gate-ing function, or summing function between two spots, which in this case is done by two diodes which are labeled 1N914.

Q Where are those 1N914s in the circuit diagram?

A If you follow the word "plug-in card" at the top of the page and go immediately below the word "card", past

that first resistor labeled 33000 or "33K", which stands for thousand, you meet those two diodes right there, 1N914, one above the other.

Q The signal output is appearing at that point, is it?

A Yes. There is some mixed together.

Q And then where is that information used after that?

A It is fed through the next stage, which is the circuitry to the right of the sum point, where it is amplified, and then enters the circuit on the right edge of the paper, which is the transmitter, and from there goes to the antenna terminals.

You will see two little arrows pointing downward at the right-hand edge of the paper, with a notation "To TV Ant. Terms".

Q What TV receiver were you using in this particular test?

A The same color RCA receiver which was bought for the program.

Q I notice immediately below the area marked "To TV Antenna Terminals", there is what appears to be a wave form diagram with the legend "Video" on it. What is that?

A That is very much the same wave form as the one

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we studied earlier today on another schematic, which shows both the presence of synchronization pulses and video pulses, except that this is a detailed representation of the exact wave form at a certain point in the circuit, so it is a little different than the textbook picture we drew earlier.

It is also upside down with respect to polarity.

Q Was the circuit shown in Exhibit 66-82A, which was dated August 2, 1967, actually built by your group?

A Yes, it was.

Q And on approximately what date relative to August 2, 1967 was that circuit built?

A Sometime before August 2nd, because that schematic indicates that we had finished the job, and it was something ready for demonstration.

Q When you finished the job, did you do any testing or checking of the circuit?

A Well, of course, the best test of a circuit such as this is in a demonstration of a game through a TV set, which we did on an ongoing basis. I don't remember making specific demonstrations of that particular unit to anyone outside of the group, although even in those days Mr. Campman used to come in and out quite often, since he was funding the activity, and he probably saw it.

Q What happened next in your development program in the group at Sanders on TV games?

A I think the first thing we did was go through another cost estimating effort for the equipment described by this schematic on Exhibit 66-82A. Then we proceeded

to build -- let's see. This is August. We built another equipment.

By that time Bill Rush had made a number of suggestions with respect to lowering the cost for the spot generators in particular, and I think it was at that point in time that we set to work and built an alternate circuit that did all the things that this thing does, plus at this point I believe we began to play ballgames, because in the interim Bill Rush had drawn up a detailed schematic on ballgames, which first occurred to him, if you remember, in this memo of May 10th, I think it was. May 10th, yes.

So we began to implement the ballgames in this next piece of equipment.

Q You indicated that Mr. Rush proposed a less expensive spot generator circuit.

A That's right.

Q How was that identified or described in your group?

A We called it a slicer circuit, because it sliced out certain parts of the waveform.

Q Did your group complete a game using a slicer circuit?

A Yes, we did.

Q What was done with respect to testing or demon-

strating that circuit?

A I believe that there has to be some record of this demonstration, I believe in January of 1969 -- 1968, rather. In 1968.

Q I hand you Plaintiffs' Exhibit 65-120, which bears the legend "CATV Demo Box".

This is a circuit diagram from the records of Sanders Associates.

Can you state what is shown in that circuit diagram?

A Yes. That circuit diagram represents a machine capable of playing a hockey or ping pong or whatever you want to call it ballgame. I say that because it contains three spot generators, and they are so designated on the schematic. There is one in the center top, just below that there is one labeled "Spot Generator Number 2" and in the upper right-hand corner there is a third spot generator. It also contains another essential element of a ballgame type TV game in the lower right-hand corner and that is a digital circuit, a flip flop, whose function it was to receive logic signals from the spot and the ball generators, and reverse the flight of the ball whenever the ball is intercepted by a paddle.

There are also shown horizontal and vertical sawtoothed sync generation circuits.

I might make mention of this: This is not the only form in which this equipment was used. This equipment, as this schematic shows, was modified specifically for demonstrating the game in connection with a cable TV game presentation, which was a concept we worked with in some depth late in November-December of 1967.

It required certain additions to a basic TV game that are not normally found in a TV game, in that when you play against what I like to call a cooperative background, a TV station or a cable station, really the same thing, except that they have a radio transmission, or a cable connects the viewer, and the transmitting station, when such a station is involved when they are putting on a program, for example -- well, let us paint a very simple picture. Let's say they are putting up the background view of a tennis court on the screen by pointing a video camera, a TV camera, against a chart that has some artist's pretty colored pictorial representation of a tennis court on it.

If you now attempt to play ballgames of the type we are talking about overlaid on top of this TV presentation, there is one overriding requirement that does not exist normally, and that is that you must get your TV game into synchronism with that game that

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is already coming in over the cable. That is a new technical problem that we solved with a couple of circuits.

Q I would like you to describe that in a little more detail.

Coming in on the cable in this demonstration box, CATV, which you have before you, is exactly what information?

A Can I put it in terms of what we really did?

Q Yes, I wish you would do that.

A We were set up for the final demonstration in a room, which actually was a so-called screen room normally used for testing equipment, where when you close a door in a screen room no outside signals come in and it is a nice area in which to operate equipment that radiates energy, and the FCC has rules about radiating energy.

In this room we set up a TV camera, a small inexpensive closed circuit TV camera, and pointed it at an easel with some flip charts on it. On the flip charts we had drawn such things as tennis courts, a hockey court or arena, with goals, some blue lines, and the output of this TV camera came via coaxial cable, which we can imagine to be five miles long, coiled up on the floor, to another bench on which we had our equipment.

Our equipment consisted of a game box and at that time a black-and-white TV set, and the game box incorporated those circuits necessary to synchronize

itself to the incoming picture signal, which was being shipped to the receiver from the camera.

Q You say those circuits necessary. Are those circuits the circuits in Exhibit 65-120?

A Yes. There are two of them in the upper left-hand. The leftmost circuits on the pages. The one that is headed "Horizontal sync circuit", and then down on the left-hand side, and the one down below it, which isn't especially identified, those are the horizontal and vertical sync extraction circuits respectively. I call them sync extraction because they extract synchronization from the TV set without reaching inside the TV set, so that synchronization signals were obtainable that corresponded to those used by the TV camera that we had set up in the screen room.

Q Can you just very functionally and in lay terms state how the horizontal sync circuit obtained the synchronization information from the TV picture of the tennis court, for example, in Exhibit 65-120?

A Well, it is a fact that there is a pretty large electromagnetic and a very large electrostatic field corresponding to horizontal synchronization pulses, really, sweep circuit pulses, behind every TV set.

If you string up a short piece of wire in back of any TV set, and if you can attach a measuring

instrument to that piece of wire, the wire acts as an antenna and 'lo and behold there is this gigantic pulse that occurs every time the beam flies back from right to left on the TV screen.

That is essentially during the time when the horizontal sync pulse exists. So, 'lo and behold, it is a surrogate or substitute horizontal sync pulse, if you can pick it up, which we did with a small metal plate or piece of wire.

You now have a sync pulse, which is in synchronism with the picture coming in over the wire cable.

Q On Exhibit 65-120, on the left there is the entry "1 inch square copper".

A Right.

Q What is that?

A Obviously that meant we used the small copper plate 1-inch square as our antenna. Extracting vertical sync is a little more difficult. About the only way to do that effectively is to look at the screen with a photocell and a flicker rate, especially if you do that near the bottom of the screen. The photocell will build up an output pulse over a series of succeeding horizontal lines on the TV set and out comes a surrogate vertical sync pulse.

MR. GOLDENBERG: Your Honor, could we have the

court's indulgence for a few moments? We just got word that a physical exhibit, a sample of a Seeburg game, has arrived. With the court's leave, I would like to bring it to the courtroom.

THE COURT: All right. We will take a recess now. It is about time, I would say.

(A brief recess was taken, after which the following further proceedings were had herein:)

THE COURT: You may proceed.

MR. ANDERSON: Your Honor, may we ask about the schedule for tomorrow?

THE COURT: Yes. That case definitely will go ahead tomorrow morning, and it is a case in which sometime ago I indicated in a notice to class that anyone who wanted to be in the class should show up tomorrow, and I am told that some are coming, and therefore there is just no putting that aside. We had to pick a definite date so that the notice would be meaningful.

So that is tomorrow morning.

Tomorrow afternoon, as I indicated, I have that sentencing seminar.

Monday we will be back and spend all day here.

Tuesday, starting on Tuesday, I have some bad news. As you know, the Speedy Trial Act imposes upon us certain obligations in criminal cases that we cannot avoid. I have two of those coming up.

Wait a minute. Excuse me. I take that back. I said we will be back on trial here Monday. I have a criminal case that must start trial on Monday. I hope that it will not take more than about three days, but then that will take me through Wednesday of next week, and then on the 11th and 12th the

Federal Judiciary Center is coming out here to have a two-day seminar for all the judges on class action and all the various other matters.

So what I am saying to you is that next week is gone for purposes of this trial. The following Monday, which is the 15th, we can try this case, and then starting on Tuesday I have a criminal case which must be tried, which is specially set for that date.

That will take the rest of that week.

I realize this is a rather difficult situation for you gentlemen. I have another case set the following Monday, another Speedy Trial Act case, with a man in custody, who has to be tried. He may not be tried. I don't know much about the case. It appears to be short, so I hope that sometime during the week of November 22nd, we can get back to this case and stay there until we finish. Maybe even on the 22nd.

MR. ANDERSON: That is the Thanksgiving week, your Honor.

THE COURT: Oh. That's right. The 25th is Thanksgiving.

I don't suppose you want to try the case the day after Thanksgiving necessarily, although we

can cross that bridge when we get to it.

MR. GOLDENBERG: We are getting into a period, your Honor, where Mr. Arthur Holt, who is our expert witness, I believe has a firm date in another trial on about the 24th. Is that correct?

THE COURT: The 24th of November?

MR. GOLDENBERG: In Alexandria, Virginia, in the District Court. He indicates that it is hard to tell how long he expects that to take.

THE COURT: Well, I had a case that was specially set for the 6th of December, which now is not going to be tried at that time. So once I get back to you, I will stay with you, and if we have witness problems, I will work something else in.

MR. GOLDENBERG: All right.

THE COURT: It just looks like the days of sitting down and trying a case of this length to conclusion are no longer with us in view of the Speedy Trial Act.

MR. ANDERSON: The week of the 6th of December I have scheduled depositions in London, involving quite a few people.

THE COURT: Don't cancel them. We will just accommodate everybody here.

As long as this is a bench trial, we can

do that, and I also am cognizant that we should do it as quickly as possible, because this is not the kind of thing -- well, it will be like one of those Chinese dinners.

So I don't want to have any unnecessary delay.

The way it looks now, just to recapitulate here, it is unlikely we will have any trial next week, and probably the next day we will get together after today will be Monday the 15th, and then not again until possibly the 22nd, the following Monday.

So you can plan accordingly.

As I say, if there is any witness problem, we will just accommodate them.

MR. GOLDENBERG: Thank you, your Honor.

BY MR. ANDERSON:

Q Mr. Baer, just before the break you described how in the game that was constructed in accordance with the circuit of Exhibit 65-120, you obtain horizontal synchronization in the upper left-hand corner of Exhibit 65-120 by using a small one-inch square copper plate, is that correct?

A That's right.

Q I think you were just starting to explain how you obtained the vertical sync signals in this game that

you built in accordance with Exhibit 65-120.

Will you go ahead and explain where the vertical sync pulse information came from in that game which you built?

A I think we actually passed that already. We already got to the Chinese dinner problem.

In the lower left-hand corner is a schematic that shows the use of a photocell, that little squiggly line in a circle being a standard symbol for photoresistor. That is a device that is sensitive to light and changes resistance as a function of light.

That device was pointed at the bottom edge of a TV set screen and picked up a few of the white raster lines on the set. In so doing it creates a pulse, which happened somewhat before, but essentially in step with the vertical synchronization pulse that is generated normally by a TV station, and therefore it is essentially in the same time frame as the vertical sync pulse which we generated in the camera we used in that screen room I described earlier.

So this little circuit in the left-hand side now becomes what I called before the surrogate vertical sync, I think I said, or generator. It allows us to lock the machine on to the display that came out of the camera.

Q Then could you very generally --

A May I make one more try at this? You might think of the whole thing as having two movie projectors in the same room. If you projected them on top of one another, slowly enough, so that you could see the frames going by, unless you ran a shaft across the room and tied the two machines together, you would never see both pictures overlayed in synchronization.

That is really what is meant by sync, keeping the two pictures tracking together.

Here we have two pictures, one coming from the TV camera and one which we generate, which is a picture nevertheless, electronically in a box, which comes out looking like squares or lines, or whatever; they have to stay together. We lock them together through these special circuits that extract the synchronization from one and impose it on the other, so as to have them hang together as though there was a shaft between them.

Q In the case of your demo box, Exhibit 65-120, as I understand it there were not two pictures superimposed, complete pictures, or am I mistaken on that?

A In essence there were two pictures, one being the background picture delivered from the camera, which in this case was a view of a flip card, with hand-drawn hockey goals on it. The other picture, if you want to

call it that, is the symbology generated by this game box, which was overlayed on top of the TV camera picture.

Q The game box you just referred to is the circuit shown in 65-120?

A That's right.

Q Can you generally describe, starting with the two horizontal and vertical sync circuits that you have just described, move through and describe generally how this circuit was used to generate the picture of the game spots?

A Well, you look at the center of the schematic and the upper right-hand corner, into the three areas marked Spot Generator No. 1, No. 2 and No. 3, and you see a series of parts which together developed very much the same signal that we got out of the spot generators we looked at in previous schematics.

This happens to be the circuitry Rush developed, and which is covered in the '284 patent under Rush's name.

The purpose of those --

Q You mentioned this is called the slicer circuit?

A We call them slicers because of the way they function.

The circuits are pretty much the same in terms of the inputs and outputs as those which we saw

before and into the circuit go three things, namely a positioning control which allows the circuit to move a spot up and down, a horizontal position control for horizontal positioning and either horizontal or vertical sync, depending on which circuit they are looking at.

Q If you can, refer to one circuit such as the spot generator No. 1 in the center top of Exhibit 65-120 and relate your testimony to that specific diagram.

A If we stay with that, you will notice the letters A and B at the left top and left bottom of that circuit. Those letters, if you look to the left, further to the left, indicate that those points were connected to the horizontal sawtooth generator, point A, on the schematic, and to the vertical sawtooth generator, point B, below that.

Q Now, am I correct that those are outputs of the two boxes, two circuit diagrams, on the left side, marked "Horizontal sawtooth gen." and "Vertical sawtooth gen."?

A That's right, they are.

Q There is a sawtooth above the "A" and a sawtooth above the "B".

A Yes. That generally denotes the waveform.

THE COURT: I don't see the "B".

THE WITNESS: If you will look at the sub-left diagram in the middle left-hand side, labeled above it "Vertical Sawtooth Generator" and if you look to the right --

THE COURT: I see. Way down there. I have it.

BY THE WITNESS:

A All right. I believe you asked me what the waveforms were. They are representative of the outputs at A and B of those two circuits.

BY MR. ANDERSON:

Q Those outputs at A and B, do those two circuits constitute the inputs A and B of the spot generator number 1 at the center of the top of Exhibit 65-120?

A That's right.

Q Can you explain that in functional terms, how those function with the rest of the circuit to produce a spot?

A Yes.

If you look at this waveform and realize that what it means is a sudden rise in voltage over a very short period of time and a slow gradual linear de-

crease from that high voltage towards grounds -- that is why it is called sawtooth waveform; it looks like teeth on a saw -- you might be able to visualize that if you sensed when this waveform goes through a certain level of voltage -- let's give it numerics in order to make it easier. Let's say at the bottom of this waveform we have zero volts, nothing, and at the top we have one volt, just to paint a picture. Therefore, by definition, halfway up on the long line, also halfway up on the short line of that sawtooth is a half volt.

If you had a circuit that was responsive and did something when you passed through a half volt level, and certainly when that long slope slides down from its maximum one volt value down towards zero and crosses the half volt line, half way down, it tells that next circuit to do something, whatever it is. That's what this circuit does, depending on where you had the hand control set. You can tell that circuit to watch for a particular part in that waveform and then output some signal.

As a result of that, when you turn this potentiometer, which turns out to be the potentiometers that are labeled 25K on the right-hand side of that schematic --

Q On the right-hand side of the center top?  
A Yes.  
Q Spot generator No. 1?

A Yes, which are the horizontal and vertical control positions respectively.

Q Which is the horizontal and which is the vertical?

A Horizontal for the top and vertical for the bottom.

As a result, when you turn those, you select different areas along the long sloping section of the sawtooth, which then results in an output from this little transistor in the middle of the schematic, which winds up in the point labeled "C", a little circle and "C".

Q "C" constitutes the output of the spot generator number 1 circuit?

A That's correct.

Q Is there a similar output for the spot generator number 2?

A That is correct. They are all identical.

Q What is the one for the spot generator number 2 marked?

A It is marked D.

Q And for the spot generator number 3 in the upper right-hand corner of Exhibit 65-120?

A That spot generator is marked "E".

Q Now, is that information at C, D and E used in some way in the slicer circuit demonstration box to gene-

rate the games on the TV screen?

A Yes. It is again AND-gated or summed together by inserting those three signals down in the lower left-hand portion of the schematic into three 1 N 714 diodes that you see connected together.

Q So the three arrows are diodes, is that correct?

A That is right, the little arrows with the flat, straight line next to the pointed arrow is a diode, which is an electronic component capable of causing a flow of electrons in one direction only and resisting it in the opposite direction.

Q In the game that was built in accordance with Exhibit 65-120, what happened to the combined information from the spot generators applied at C, D and E to that summer circuit?

A Schematically it went on through --

MR. GOLDENBERG: Excuse me --

BY THE WITNESS:

A (Continuing) -- the several transistors to the right of those three diodes we just looked at --

THE COURT: Excuse me, there is an objection.

MR. GOLDENBERG: I perhaps missed it, but I am not too sure that there has been testimony that the game was built according to the circuit. If I have misheard, I apologize.

Perhaps the easiest way would be to ask the witness.

MR. ANDERSON: I would be happy to. I am sorry. If I didn't ask the question, I thought I had.

BY MR. ANDERSON:

Q Mr. Baer, will you state whether or not a game was ever constructed in accordance with Exhibit 65-120?

A Yes, it was.

Q Can you describe approximately when and where that game was built?

A The game was built initially roughly in November, October, November, early December of '67 and rebuilt to work in conjunction with this cable demonstration with the additional two circuits on the left-hand side of the schematic towards the end of December in preparation for a visitation to Nashua by Teleprompter people.

Q Was it actually demonstrated?

A Yes, it was.

Q Does the equipment still exist today?

A Yes, it does.

Q Is it in the courtroom; do you know?

A Yes, it is.

Q I hand you Plaintiffs' Exhibit 59 and ask you if that is the equipment that you have just identified.

A Yes, it is.

Q Can you describe the various parts of the equipment, Exhibit 59, and how they function in general to play games?

A Yes, as you can see, at the end of some long and tangled cables are a series of hand controls. In fact, I believe they are still labeled.

These were for the two participants in the game and consisted of the vertical and horizontal positioning controls for the ball games. There was also a third knob, which we came to call the English knob, which allows us to put English on the ball, and in plain, simple language controls the vertical flight of the ball after it has been intercepted by a paddle.

Once you hit the ball you can control the vertical path of the ball in this particular game with a knob.

Q When you say "in this particular game," you are referring to the one that was actually built and is now Exhibit 59?

A That is right.

Q There is a large box connected by cables to the controls you have just identified. Can you state in general what is in that large box?

A In general, specifically what is in that box are components which are represented by the schematic in 65-120.

It is not too hard to identify them at a glance, as a matter of fact.

Q Returning if you will then to the circuit diagram, Exhibit 65-120, you were just explaining how the signals in the actual working model were combined at the points C, D and E, at the bottom of Exhibit 65-120.

Will you continue with that?

A Yes, I was beginning to tell you that after combining the signals, they pass through two successive transistor stages -- in fact, three transistor stages -- until you wind up at the notation "Ant. --" antenna -- "crowbar."

Here's another circuit that was added specifically for this cable demonstration. There is another problem which we solved. In fact, our patent covers this particular situation.

In a normal TV game, if you are entering the antenna terminals, you essentially duplicate a transmitter. You create a little broadcasting station and you send out a signal.

Here we were already receiving a signal, over a cable in fact, from our TV camera sitting in the same room with us.

Now, how do I introduce the video signals in the TV set? Again, I have a TV camera coming in, modulating a transmitter coming in on Channel 3 and going through the antenna terminals of my TV set. That is a complete transmitter-receiver link. I can't get into that

in any place else, except one place, and that is the antenna terminals of the receiver. There is no other way to get into that TV set, that is the only one that is available to me as the viewer at home.

In comes the cable through the wall, or out through the window, or from an antenna by a lead-in from my roof. There is only one place I can interact electrically, interconnect, to this setup, and that is through the antenna terminals.

I can't put a second transmission in the same antenna terminals into which I have already stuck the transmitter, unless I do some very, very complicated things, locking the two transmitters together. That is not a practicality because one transmitter is six miles away in a cable station, or it is WABC, fifteen miles away, on top of some hill.

There is no practical and certainly no cheap way of locking two transmitters together. So the question is how do I produce a video modulation on this screen? Well, that requires a technique we call crow-bar.

Let's go back for a minute to the fundamentals here. If you remember, a video signal was a signal that determined the brightness of a spot on the screen. It turns out that in American usage, a very white signal on a screen corresponds to the lowest power transmission, rate of frequency transmission, from the station, from the carrier; whereas the synchronization signal is blacker than black, as we called them this morning, and corresponds to maximum transmission of power.

So let me repeat that. Minimum transmission power is white. Maximum is black.

If I had the ability to temporarily interrupt the carrier -- and interrupting the carrier certainly produces minimum power generation. Like, it cuts it off. If there is zero power, it certainly is minimum. You can't get lower than that -- if I had the ability to minimize the carrier for a moment, and since by definition lowest carrier is white on the screen, lo and behold I would get white on the screen.

That is what I did here. I used the signals which I created in the TV game machine to drive, call it the big switch, and the big switch closes and shorts out the antenna terminals every time you want white to appear on the screen. That is exactly what it does, and we call

that thing a crow bar. It is sort of a descriptive term.

Q Can you relate how the --

THE COURT: Is that device part of this invention?

THE WITNESS: No, it is disclosed in one of my TV game patents, your Honor, but I don't recall which one. It certainly isn't germane --

MR. ANDERSON: It is not an issue here with respect to either of the two patents, as far as I know.

THE WITNESS: I should have ignored it.

THE COURT: That is the kind of --

THE WITNESS: The kind of thing we shouldn't put in.

THE COURT: That is the kind of thing we probably should avoid.

THE WITNESS: Sorry about that.

MR. ANDERSON: I hated to interrupt the witness.

THE COURT: No, it is interesting, but ...

THE WITNESS: I am not getting paid for lectures here.

THE COURT: I really would rather concentrate on what is involved in this specific case.

MR. ANDERSON: As far as I know, crow barring

doesn't enter into the issues of this case.

BY MR. ANDERSON:

Q Mr. Baer, can you explain how the third spot, the ball, is caused to apparently reverse its direction on the TV screen in the circuit, Exhibit 65-120, as you built it and used it with a TV set?

A Yes, I will try.

If you will look at the lower right-hand corner of the schematic, there is a series of symbols, headed by the word "flip flop".

A flip flop is a digital device whose outputs are characterized by having one of two states. When that device is triggered, if you look at one output, for example, it might be a zero or low voltage. When it is triggered again, that output reverses polarium and becomes high. It is really a basic memory element. You might think of it as being able to remember one bit of information.

This flip flop, as I said, resides in either one state or another. Since it has two outputs and those outputs on a schematic wind up at the terminals A, B, C, D and A', B', C' on the other side of the flip flop -- and again, I might say that those two opposites are always opposite. When one is low, say zero volts, the other one is at maximum supply voltage and vice versa.

Those outputs reach up to the upper right-hand corner and, just below that, to a spot generator. You will see corresponding A's, B's, C's and primes up there, and the following thing happens --

Q When you say reach up, you mean actually the physical thing --

A They are physically connected.

Q Wires would extend?

A Wired to those points.

I might mention parenthetically that those wires aren't shown on the schematic just to avoid complexity on the schematic, but the corresponding symbols, like C and C' denote a physical connection between those two points.

At any rate, when this flip flop is in one state, it causes such voltages to be applied to the horizontal and vertical input of this spot generator so as to cause the spot generator to gradually move the ball from one side to the other and from top to bottom or vice versa, depending upon the voltage that is supplied, that is, depending on the state of that flip flop.

It might become a little clearer if for a moment you look back at the manually controlled spot generators.

Q Specifically spot generator No. 1, for example?

A Spot generator No. 1 and spot generator No. 2.

As you know by now, these are controlled with manual controls which have knobs on them, which people turn.

Q So these spots are equivalent to the paddle or the player's piece, is that right?

A That is right.

Q 1 and 2?

A 1 and 2.

Q What does 3 correspond to in the play of the game?

A The ball or the puck or whatever is moving, the hit spot.

Q So some spot that is being hit?

A Some spot that is being hit.

Since that spot isn't being moved back and forth under player control -- the machine moves it -- we have to substitute voltages in exactly the same point where we introduced those voltages in the case of the player spots, namely, at the end of this 2000 ohm resistor.

If you look at spot generator No. 1, there is a 2k, which means 2000 ohm resistor, drawn to the arrow on the 25,000 ohm pot.

Now, without getting very complicated,

when you move that arrow up and down, that is a slider, a contact inside of the control, which picks off more or less of the voltage that exists across that potentiometer. If the arrow moves up to the top of the paper, it reaches the point which is labeled here "Vcc", which is parlance for the highest positive voltage in the system.

When it gets down to the bottom it reaches this little three-line symbol, triangular symbol, that connotes earth or ground, which is usually considered zero voltage.

So by moving the slider up and down, you can go between zero volts and maximum volts. If you had a 9-volt battery connected to the system, you could go between zero and 9 volts smoothly as you move up and down this pot, pot, being short for potentiometer.

In that fashion we move the spots up and down and left and right across the screen. In order to move a ball spot automatically, you have to recreate those voltages somehow in such a way that they are right to move the ball at the right speed horizontally and at the right speed vertically, depending upon what kind of ball action you want.

That is really the function of those four pots, that terminate in terminal A', B', C', D' and A, B, C, D. By connecting those pots across voltage source, which is

in turn provided by this flip-flop in the lower right-hand corner, we offer the right kind of voltages to these pots. so as to cause the spots to move independently.

We cause this flip-flop to flip and create the right conditions every time the ball appears to be hit by a paddle on the screen, when there is what we called coincidence before.

Q In the circuit that was built according to Exhibit 65-120, did the ball or other hit spot, which was produced by spot generator No. 3, stand still on the screen or did it always move, or just what was the character motion?

A The character motion is reciprocal. As long as a spot was intercepted by a player, it immediately turned around and went the other direction.

In addition to that, there was a vertical component, that is, it didn't go straight across, but it went at some angle, either upwards or downwards, in addition to this horizontal flight, depending upon several things.

It would continue to the other side of the screen until and if it were intercepted by the opponent's paddle, and then the action would reverse. If it were not intercepted, the ball would just continue to fly off to the left or right on the screen and disappear.

Q What games did the circuit, according to Exhibit 65-120, simulate in the actual equipment which you built?

A We demonstrated this interactive ballgame and introduced it as a ping pong game to Teleprompter. By the same right, we could have called it a tennis game. It is strictly in the mind of the observer.

Q Was there any fixed visible line in the circuit or game that you built according to Exhibit 65-120?

A No, the schematic doesn't indicate.

There wasn't any.

Q What is your recollection?

A No, there wasn't any.

Q Do you know approximately when the circuit of Exhibit 65-120 was completed and operated?

A No, I don't know exactly when it was completed, but I know when it was operated because it was operated for demonstration to Mr. Schlafly, a vice president of Teleprompters, and I think a week or so later to Mr. Cahn, who was then president and chairman of the board of Teleprompter Corporation.

Q You say that was sometime in January of 19--

A Sometime in January of '69 -- where are we?

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which is a copy of a page from one of the Sanders' laboratory notebooks. It is dated 11-15-67, project number TVG.

Can you identify that document and state approximately when you first saw it?

A Again, this comes from one of our laboratory notebooks. In this case it is in Bill Rush's handwriting. It is Bill Rush's handbook.

This page is dated 11-15-67.

Q Please review that document and state whether it refreshes your recollection with respect to the slicer circuit games which you have been testifying about.

A This is Rush's records to the effect that, at least as of that day, we had a three spot ballgame going on a screen, as distinct from the two spot maze-type game.

If you will look to the third line of this page, it says here, Bill Rush says, "We now have a three spot flip flop --" "ff" stands for flip flop -- "ball-game".

So that indicates that at least the precursor of this hardware, or the bread board hardware sitting on the table, before getting integrated into a chassis, which is represented by 65-120, was in essence working on November 15, '67, which I guess is what I roughly indicated before.

Q Did you have any other three spot flip flop ball-game other than the circuit of Exhibit 65-120 and its precursors?

A Not at this point, although we were beginning to work on other games, specifically complex hockey games concurrently. There were quite a few activities going on simultaneously starting about that time.

Q Had your group considered any other applications for your TV games other than in the home of a private owner?

A Yes, in particular in connection with a more complex hockey game, which Rush describes in some detail in the '284 patent, and those are games in which the ball moves in a very complex fashion.

Just to explain what I am saying, let's go back and see what he teaches there.

Games in which the ball doesn't just move in some arbitrary fashion after being intercepted by the paddle, but the ball actually moves like a real live ball would. It moves in the direction in which it is being hit with a velocity that is somewhat proportionate to how hard it is kicked, a real live ball.

In addition to that, the ball also bounces from walls in a real live english fashion, and that is what I mean by more complex games.

We had started to build some of these things in bread board form during that same period of time. These things were all going on concurrently.

We demonstrated that to some of our people, and as we sat around, we speculated on what you might do with this. It became apparent then -- this is in the days when integrated circuits are not so ubiquitous in every piece of hardware. They were still pretty expensive, and even worse than that, they are power hogs. They require a great deal of power and were not compatible with battery operation. This therefore required constructing a chassis with an awful lot of components under it. Just an initial look at this aggregate of hardware made it obvious that we were never going to get this thing down to what we had then, in our ignorance, considered a reasonable price. Today people think nothing of spending \$150 for a game for their basement or playroom. That certainly wasn't the concept we started out with. We thought that \$30 was the utmost price tag.

So what Rush had created and what we built didn't look like it might fit into a home environment. So we sat around and speculated what else we might do with it.

An obvious application was a bar application. Every bar has a TV set sitting on top -- at least

it had then and still has today in most instances -- a TV set sitting on the shelf somewhere for the entertainment of the patrons.

What more natural thing to think of than to play ball with a set in full view of a whole audience, all of whom are sitting around sharing and, I suppose, buying beer for the women.

There is, I think, some reference to that somewhere in the record.

Q I hand you Plaintiffs' Exhibit 70-30 and ask you if that is the reference that you had in mind?

A Yes, that is it. That is an entry in Bill Rush's notebook on December 14 of '67 -- no, it is December 15.

Just above the encircled portion there is another date, 12-15-67, which says, "TV 5 Man Team Hockey, Sell to Bars and Clubs."

Q You testified you did discuss this subject with the other people in your group. Does this refresh your recollection of the approximate date when that occurred?

A Certainly at least on that date or around that date we must have discussed this application.

Q After your group completed the game box illustrated in Exhibit 65-120 and demonstrated that box, what additional work did the group do on TV games?

MR. GOLDENBERG: Excuse me. Has 70-30 been offered as an exhibit or is it being used to refresh his recollection?

MR. ANDERSON: It is part of one of the Sanders exhibits, Sanders Deposition Exhibit 19, which will come in with the rest of the Sanders exhibits as part of the Rush and Harrison testimony.

MR. GOLDENBERG: Well, you recall, your Honor, that I raised this question this morning about this

witness testifying about other people's notebooks.

We are at that problem again, and it was left that Mr. Anderson could use such documents as this present exhibit to refresh the witness' --

THE COURT: I sort of backed off that, though, when on the next few documents Mr. Anderson brought out that the witness was really in daily contact with these people. They were working apparently under his supervision.

I really think that unless there is some point I am missing in your objection, Mr. Goldenberg, this is virtually a joint project. The fact that somebody else wrote it down --

MR. GOLDENBERG: Here, your Honor, the problem is that what we are dealing with, with respect to this particular exhibit, is a document that I don't know what the date of it is. I don't know who wrote it.

It is being offered -- well, I do see a date, 12- --

THE COURT: 12-15-67.

MR. GOLDENBERG: But we don't know who wrote that. We don't know when that date was written on there.

It is being offered, I believe, as evidence that on that date certain thoughts or discussions were had.

THE COURT: I am assuming that that is so. If that is not so, we ought to bring out what the fact is.

MR. ANDERSON: I will at this time hand forward the entire Plaintiffs' Exhibit 70, which is a bound notebook that was identified during these extensive, total of 28 days of deposition of the three Sanders Associates employees, who made up the group.

The pages are dated, each one, I believe. The one preceding it, page 28, is dated 12-13-67. The one in question at the top is dated 12-14, and in the mid-point 12-15. The next page is dated 12-18-67.

There was extensive testimony. I think there can be very little question about the fact that the document was produced and authenticated.

THE COURT: Let me ask this on the matter of law here. Does it make any difference where the individual ideas came from? We have Rush and Baer getting the patents. If they are working with a number of people, does it make any difference that the other people had something to do with the development of the ideas?

MR. ANDERSON: With respect to this document, your Honor, I don't think it makes a particle of difference.

THE COURT: This has to do with the possible utilization of the invention rather than the invention itself, I take it.

MR. GOLDENBERG: I understand that with respect to this question it is not a matter of particular moment, but with respect to any idea that might be embodied in the patents and claimed as an invention or part of an invention, it is a matter of critical moment as to who did get the idea because the law specifies that the patent must go to the inventor. It cannot go to someone who was merely an associate. It cannot go to, say, a technician who carries out, builds some circuits, under the instruction of the inventor.

So it is a matter of moment, and this is precisely the concern I have, that we have a sort of an indistinguishable quantity of work here.

THE COURT: What do we have here by way of issues framed by the pleadings on this particular point?

I realize that the defendants deny that this is a novel idea. Do they also deny, or was there any occasion for them to deny, that the claimed inventors here were the persons who developed the ideas to the extent that they aren't anticipated by prior art?

MR. GOLDENBERG: Yes, right.

THE COURT: Have I made clear the question?

MR. ANDERSON: I think so, if I may address myself to one aspect.

With respect to whether the proper inventors are named in the patents, I do not believe that has been put in issue by any defendant in this case. I might point out that under the patent statutes, 35 United States Code, it is very easy to change the names of the inventors, provided you always have one inventor, for continuity, from the beginning to the end. You can drop and you can add inventors, and if it should turn out during this trial that the Court found or that the parties found that we needed to add an inventor or delete an inventor from a multi inventor patent, that can be done in Court

by your Honor. It is a matter that could be corrected at any time.

I say that with reservations. You must have one inventor right all the time.

THE COURT: At what point does the plaintiff claim that the invention occurred here? Is there an exact point in time at which you say the invention occurred and have I already heard it, if that is the case, because if we already have the invention, then it doesn't make any difference how many cooks are in the soup.

MR. GOLDENBERG: If that has happened, your Honor, I will let Mr. Anderson respond to your question, and do have in mind, as he does, that we are talking about two separate patents.

THE COURT: Yes, I understand, two separate patents.

MR. ANDERSON: There are multiple claims in both of the patents, but I think, to answer your question as best I can in a generalization, I believe that Mr. Baer's testimony about his discussion with Mr. Rush in April of 1967 and the May 10, 1967 memo does relate to Mr. Rush's patents, the '507 patent, and the idea of having an interactive game with manually moved player symbols, causing a game con-

trolled ball to bounce back and forth.

That was the first document that I know of that mentions that. It was Mr. Rush's memo, and it followed through to the point where this equipment was built and tested in the fall of '67.

In general, I believe that is support for the activity with respect to the '507 patent.

THE COURT: These devices here that we have seen in evidence, they are a reduction to practice, are they, in the plaintiffs' view of the matter?

MR. ANDERSON: Yes, your Honor. As a matter of fact, again as I view it -- and perhaps Mr. Goldenberg will disagree -- we even have among the stipulated agreed facts support for certain of these reductions to practice.

Maybe without looking it up, do you agree with that, Mr. Goldenberg?

MR. GOLDENBERG: I think we do, your Honor.

THE COURT: I think what I am going to do is I am going to take all of this in, and then I will let the defendants point out at some time what they think is the input of some person not named as an inventor, and we will see whether that is the case.

We will see whether any portion of the claimed invention originated elsewhere.

MR. GOLDENBERG: I am not prepared to say at this time that the question of whether a proper inventor has been named is an issue. I am not too sure that it is. That question is possibly there; but I think more significantly, the point that we really will want to have clear is not only who made an invention, but the order in which inventions were made is a matter of moment because that which is invented first is prior art to that which is invented --

THE COURT: We are going chronologically here, I think, aren't we, as far as the testimony is?

MR. ANDERSON: Yes, your Honor, we are certainly trying to.

MR. GOLDENBERG: There is a chronological order to it. I agree to that, but nevertheless, by using one witness with another witness' notebooks, we are running into this problem of just who did what.

I made my objection on the basis that, whereas, as I have said before, I have no question as to Mr. Baer's right to testify to that which is in his memory and that which he knows, and I have no objection to a document being offered to him to refresh his recollection, on the other hand, when the document, the author of which was unknown at

the time I made my objection as to who recorded it and that sort of thing, when that is offered to prove the fact of the matter, then I feel I am entitled to come and make the objection I made.

That was my sole purpose.

THE COURT: I don't deny your right to make the objection.

Did we establish who was the author of this 70-30, whose handwriting that is?

MR. ANDERSON: Excuse me, your Honor.

I actually think that we do have stipulated facts that cover this and several of the related points, beginning with 146 of the book of stipulated facts.

MR. GOLDENBERG: I think the question was have we established who the author was?

MR. ANDERSON: Oh, yes, Mr. Baer did testify, I believe, that it was written by Mr. Rush.

THE COURT: All right, I will overrule the objection.

BY MR. ANDERSON:

Q Mr. Baer, I hand you Exhibit 65-119, which is a small circuit diagram very similar to the exhibit about which you have just been testifying, Exhibit 65-120.

Can you state what is shown in Exhibit 65-119?

A Yes, Mr. Anderson. What is shown here is essentially the same circuitry described by the previous schematic, 65-120, except that those particular circuits which I belabored before in connection with a CA TV demonstration are omitted on this schematic.

Q Those are the two inputs on the far left side of 65-120?

A That is right, sir. In fact, there is a note on the upper right-hand corner in my handwriting on this schematic that says, "Box No. 4," which was our original description of the box we looked at a while ago, "prior to installation of CA TV horizontal and vertical sync pickoffs."

So that describes this box. In fact, I referred to that condition of the box sometime ago here, a half an hour ago, prior to the time we modified it for demonstration to the Teleprompter people.

MR. ANDERSON: I would point out for the record that stipulated agreed fact 157 recites:

"The circuit shown in Plaintiffs' Exhibit 65-119 was built, tested, and satisfactorily completed prior to January 15, 1968," and the subsequent two agreed facts relate to that circuit also.

BY MR. ANDERSON:

Q Mr. Baer, after you demonstrated the circuit and game of Exhibit 65-119 and 65-120, what additional work did your group do on TV games immediately thereafter?

A If I recollect correctly, we weren't very happy with Bill Rush's slicer circuits and the method in which

they generated spots. They were somewhat subject to power supply variations. As the batteries died, spots would shift on the screen, that sort of thing.

Without going into great detail, we weren't very happy with them from a performance point of view.

We decided to take another look at the work we had done earlier in the prior boxes, which we saw here this afternoon, and some intermediate ones, which we didn't see, and combine some of the best features of Rush's machine with the early ideas and some new ones that came along.

A new machine was generated, probably again within weeks of this January date when we demonstrated the machine to Teleprompter. That machine, I think, was a bear-bones machine. It had absolute minimum number of parts in it. It was again capable of playing ball games, chase games, and simulated checker-type games. I don't remember whether it was fitted with a rifle attachment.

I am quite sure that we carried that through to a point where we had a clean-looking unit and a good set of material lists, which we perceived the price out to see just where we were in terms of the commercial product.

Q As you continued that work and reached, I think you said, a clean-looking unit, approximately when did you

reach the point where you had this clean-looking unit, if you know?

A I am not sure whether we did that in the spring, that is, in the period of January, February, March of '68, or whether that was done -- there was a hiatus, if I remember, in the activity in the spring and summer months, early summer months of '68, when I got too busy.

Rush continued to work on paper on that and some other job under my supervision, when I got drawn away and when Harrison got drawn off on another project somewhere. The effort resumed sometime in August, I believe.

So, I am not sure whether you will find that box in the time frame of January, February, March or August, September, October.

Q Does this clean looking unit that you refer to still exist?

A I saw it here in the courtroom today.

That's the one (indicating).

Q I hand you Plaintiffs' Exhibit Number 61 and ask you if that is the one you were referring to when you just said "That's the one"?

A Yes, I recognize that as being the equipment we built subsequent to what we called the Teleprompter demo unit.

It is still, indeed, in pretty decent shape.

Q Can you describe what circuit was employed in that demo unit?

A Yes, the circuitry in this machine is comprised of spot generators, which we came to call digital spot generators. I think we identify them that way on the schematic for several reasons.

Number 1, they are digital in nature circuitwise. Number 2, it produced a nice, square rectangular spot on the screen, which is something that the slicing circuit, Rush's slicing circuit, didn't do well.

In other respects, circuits like the flip flop required for reciprocating the ball, I think you will find to be identical to what we had in this last exhibit.

I just observed that this thing does have a jack on it, which I think was for the rifle attachment.

Q I place before you Plaintiffs' Exhibit 65-261. That is a vellum pencil drawing.

Do you know if that circuit corresponds in whole or in part with the physical model you have just identified, Exhibit 61?

A Yes, sir, it does.

Q Did you continue your work after that construction of Exhibit 61 was completed?

A Is your question did we build other equipment or did we continue the work?

Q Yes, or did you test this?

A Oh, yes.

Q What happened next?

A November, '68, subsequent to this unit, we built still another unit. I believe, if you look at this machine, you can see a switch out front which has three --

Q When you say "this machine", you are referring to Exhibit 61?

A Exhibit 61 has -- well, you can't tell it from this -- a three position switch, and it is so indicated on the schematic we looked at earlier.

Q What is the purpose of the three position switch?

A It allowed three different games to be played, that is, a game consisting of two spots for the chase type game, maze-type games, one for a hockey game, and a third position for, I believe, the rifle attachment. I am not too sure of that.

That was a very limited menu of games, and we thought that might not be a viable product. So we decided to go back to the bench and build a more complete unit.

There is at least one, or maybe two more iterations of hardware between this and the end of the line.

Q What is the next physical device that was actually built and tested by your group after Exhibit 61?

A We built another box that had a large number of switches, with which one was able to interconnect the elements, the various circuit elements, in various ways so as to be able to produce a much larger -- I called it a menu -- much larger variety of games for viewing.

I don't know exactly when that was made, but that is also present in the courtroom. It is the brown box on the exhibit table.

Q What were some of the games that that brown

box was able to play?

A Again, we played the two spot chase games or checkerboard games. We played a hockey game on this machine. We played ping pong or tennis on this machine. It also had a rifle attachment. We played handball on that machine. I believe we played volleyball on that -- yes, we played volleyball.

I think you could refresh my memory if you looked inside that machine. Unless it is lost, there should be a series of cardboard cards in there which were used in setting up the function switches. If we run through the cards, they will have a listing of the games that are built into that machine.

Q I will place before you the boxes which have been identified as Plaintiffs' Exhibit 62. Is that the game to which you have just been referring?

A Yes, sir.

Q Would you see if the cards are in the cover and explain what they are, and point them out to the court?

A At least some of them are here. They are labeled or numbered, so I might as well arrange them in numerical order.

(Brief interruption, after which the following further proceedings were had herein:)

BY THE WITNESS:

A Once more, by way of explaining what these cards did, they were just a memory aid to help set up this large number of switches. You place the cards between the switches, like so --

BY MR. ANDERSON:

Q Which card are you placing between the switches?

A At the moment I am placing the card labeled No. 1 and called "Checker Games" on the box. It indicates that this switch is to be thrown down and all the others are to be up.

Q When you say "this switch is to be thrown down," you were pointing to the one that is lined up with a red dot on the card?

A That is right, sir.

So in sequence we had the following games, and we used to demonstrate them in sequence also.

First we played a series of checker games. For the checker games we had a variety of overlays that may or may not exist any more, which are transparencies overlaid on the screen or TV set.

The second one was a chase game, in which two spots chased each other. Incidentally, most of these games were played in color, and some of the dots in the bottom indicate the background color that we used.

The third one was a ping pong game. In fact, it says here "green", so you throw the bottom right-hand switch down.

In this case, I guess, it is the fourth switch from the right. You throw that down and up comes background color, in this case green, because obviously you play ping pong on a green background.

On the other hand, here is a hockey card, card No. 4, and it says blue here because certainly you want to play hockey on blue ice.

Volley ball is the next one, No. 5, and that we played in green. Maybe we should have played it on a brown background.

Then comes a series of checker games with obstacles. If I remember right, it was a matter of putting an overlay on the screen, in which there was sort of a checker board or chess board, and the object was to chase

each other without touching the black areas, the black squares.

The next game, No. 7, was a handball game, which is distinctly different from the others. We haven't talked about handball before because a wall appears in the left-hand side of the screen and the players are over on the right-hand side and play the ball alternately or competitively by bouncing it off the wall on the left-hand side of the screen.

Q So with respect to that game, handball, would you show how the box, Exhibit 62, would be set up to play handball?

A Certainly. We would start off with all the switches in the neutral position, and then flip the first and the third switch down to meet the red dots, and finally flip this switch upwards. That one determined the color.

Q The bottom switch --

A -- determined the color of the background.

Q -- determined the color.

A It reaches the circuitry at the bottom of this chassis where all the chroma hardware is located.

Q Do you recall what the other two red dots accomplished in setting up for handball?

A Yes, one of the switches was a line which was

located centrally during the ping pong or tennis -- I guess ping pong -- game, and denoted a net, central net.

One of these switches shifts that line from the central position to the left and also reconnects some of the larger interconnections inside so as to allow a logic structure inside the machine to make the necessary decisions.

By decisions, I mean recognize, first of all, when the ball has been intercepted, say, by a wall, and returned, when the ball has been intercepted by one of the players, which of the players, and to return the ball. All these are logical decisions that have to be made. The elements for them are all logic signals which are interconnected in a logical arrangement through the switches so as to create the right conditions for the particular game.

These conditions change from game to game. That is what these switches accomplish.

Q Was a circuit diagram made of the game, Exhibit 62?

A Yes, sir.

Q I will hand you Plaintiffs' Exhibit 64-281 and ask you if that is such a circuit diagram?

A Yes, sir, it is.

Q Do you recall whether this conforms exactly or substantially with the physical exhibit 62, or if there are any differences, can you point out what they are?

A The only differences at first glance are the penciled annotations which will probably show up on the copies as just another series of lines in the bottom right-hand corner, which represent additional work done sometime later, which I don't recognize; but the part of this print which represents the initial draftsman's representation of this hardware represents exactly what is in there, or at least what was in there at the time those games were played.

Q Is this circuit of the physical exhibit, 62, and the drawing, Exhibit 64-281, a form of slicer circuit?

A No, it is not.

Q Does it have any other identification in your nomenclature that would identify it succinctly?

A Well, certainly, you know, since I am familiar with the circuitry, I know it is the circuitry which we labeled digital circuitry. I believe there are other documents where that is specifically identified or at least circuits and sub-circuits are specifically identified as being the digital circuits. I can certainly explain why they are called that if you would like me to. I don't see any nomenclature here that says so; nor do I see any reason for it.

Q Do you know whether any of the circuitry of Exhibit 64-281, of the physical model Exhibit 62, are included within either of the patents in suit?

A Oh, yes. These circuits are included in A285.

Q That is the second patent in suit, your Honor, the Rush-Harrison-Baer patent.

THE COURT: I am sorry. I think I missed that.

MR. ANDERSON: This exhibit, 64-281, is the circuit diagrams or some of them that are incorporated in the '285 patent or the reissue '598 patent, the second patent in suit, which is the three-inventor patent in the names of Rush, Harrison and Baer.

Your Honor, would this be an appropriate time to break?

THE COURT: I thought we might go until five. I will not go after five. Since we are being so cut up here, I thought if you wanted to, as long as we have everybody here, we might make the maximum use of the day. But if this represents a logical stopping point for you, it is all right with me.

MR. ANDERSON: It actually does.

THE COURT: All right.

MR. ANDERSON: But I can go on.

THE COURT: All right.

Did another one of these diagrams consist of the diagram for the first invention, the first patent?

MR. ANDERSON: Another diagram does correspond to the circuits that are shown in the first patent, the Rush Patent. This is with respect to disclosure, and that would be the circuit shown in the circuit diagram which is labeled CATV Demo Blocks, and which is Plaintiffs' Exhibit 65-120, I believe. Is that correct?

THE WITNESS: Yes. That is right. I have the original in front of me.

BY MR. ANDERSON:

Q I might ask one or two concluding questions about this diagram, and then we would be ready to change

to another subject.

Mr. Baer, I think you said this game as shown in the circuit diagram and in the physical exhibit, No. 62, was capable of playing tennis, is that correct?

A I think we call it Ping Pong, if I remember right; by reference to the cards I can straighten that out.

Ping Pong.

Q And in Ping Pong did the equipment, Exhibit 62, employ any fixed visible lines on the display, do you recall?

A Yes. There was a central line denoting the net.

Q Did that affect the play of the game in any way, or was it just for visual completeness?

A It was just for cosmetic purposes. It had no interactive function.

Q I believe a few minutes ago you testified about the game handball and showed how it was set up, and I think you said that in setting up handball you threw a switch that moved that visible wall to one side of the screen. Did I understand you correct?

A Right.

Q Do you recall which side it moved to?

A The left-hand side.

Q What was the effect of that visible wall in the play of the game Handball in Exhibit 62 when you built and operated it?

A I believe I already testified, but in addition to performing the shift of positioning of a central line to the left-hand side to convert the net to a handball wall, we also effected with the same switch new logical interconnections within the machine and set it up so that this wall in fact became recognized in the circuitry as a barrier at which the ball stops and reverses its path.

Q Mr. Baer, I think you indicated that Exhibit 64-281 was drawn at about the time this work was done, and certain revisions were made in it later. Approximately on what date was the circuit diagram, with the exception of the longhand changes, prepared, if you know?

A That would have been sometime towards the end of 1968.

Q Can you relate the making of the drawing, Exhibit 64-281, to the first completion and demonstration of the actual physical device, Exhibit 62?

A Yes, because we used this demonstration equipment many, many times in the following year for demonstrations to representatives of most of the major TV manufacturers who came up to Nashua and saw the box. And since those visitations to Nashua started, I believe

in January or February of 1969, clearly the box had to be finished before that; so that places it into the latter part of 1968.

Q Did the box, Exhibit 62, actually function to play all of the games for which cards existed in the envelope on the top of the box?

A Oh, yes. We developed a routine for demonstrating the box in accordance with the sequence in which these cards we saw earlier here are ordered, and always followed through that routine religiously unless the viewers and visitors decided they wanted to replay something.

MR. ANDERSON: This represents a logical breaking point, your Honor.

THE COURT: We will recess until, as far as I know, the 15th of November. If anything should happen in the meantime, we will be in touch with you. It looks like the 15th is the best we can do now.

By the time you come back, I will have read your trial brief and your statement of uncontested facts.

Thank you.

(WHEREUPON, the hearing of the above-entitled cause was adjourned to 10:00 a.m., Monday, November 15, 1976.)